



## **Factors Influencing Effective Menstrual Practices and Management among Girls in Kibera Slum, Kenya**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author MLC conceived the study, collected data and wrote the first draft of the manuscript. All authors contributed to the study design, data analysis and interpretation of the findings. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Aims:** The aim of the study was to assess menstrual hygiene practices and examine access to sanitary materials and facilities and how they influence effective menstrual practices and management among girls in Kibera slum Kenya. To achieve this cross-sectional study was conducted in mixed day secondary schools.

**Methodology:** A cross – sectional study design was adopted. Simple random was used to select 25% of public schools and 25% of private schools with a population of 1778 girls. Fisher's sample size formula was used to select 384 respondents. The study was conducted in Kibera slums, Nairobi Kenya. Data on factors influencing effective menstrual practices and management among girls in Kibera slum was obtained through interviewer administered questionnaires. Chi-square test of independence, Pearson's correlation analysis and multiple regression analysis were used using IBM® SPSS® Statistics 20.

**Results:** Menstrual management amongst the 355 secondary going girls in Kibera slums with a median age of 16 years was influenced by menstrual hygiene practices and access to sanitary materials and facilities. These two factors accounted for up to 75.3% as indicated in the regression model. Of the two factors access to sanitary facilities and materials had the greatest influence on

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menstrual management ( $\beta = 0.842$   $p < 0.05$ ) while menstrual hygiene practices had the least effect ( $\beta = 0.089$   $p < 0.05$ ).

**Conclusion:** Our study identified that menstrual hygiene practices and access to sanitary materials influenced effective menstrual practices and management among girls in Kibera.

*Keywords: Menstrual practices and management; menstruation; sanitary materials.*

## 1. INTRODUCTION

Menstruation is defined as the process of discharging blood and other material from the lining of the uterus at intervals of about one lunar month from puberty until the menopause, except during pregnancy among girls and women [1]. Menstrual hygiene refers to the using of clean menstrual management of materials to absorb or collect blood that can be changed in privacy as often as necessary for the duration of the menstruation period, using soap and water for washing the body as required, and having access to facilities to dispose of used menstrual management materials [2]. In order for menstruation to be handled hygienically, it is important that girls and women have adequate and accurate information on proper menstrual hygiene practices, access to water and sanitation. They need a private place to for changing sanitary clothes or pads, clean water for washing their hands and cloth, and facilities for safe disposal of used material or a place to dry the reusable ones [3].

Menstrual hygiene management is a subject that has not received adequate attention in the reproductive health and Water and Sanitation and Hygiene sectors in developing countries [4]. Menstrual hygiene management stemmed out of the education sector in developing countries because many girls would miss classes while several others dropped out of school when they have their periods [5]. Menstrual hygiene management has often been a problem for adolescent girls in low income areas like the slums particularly when they are attending school because these areas have poor water and sanitation facilities, inadequate puberty education and lack of menstrual hygiene management items which include the appropriate absorbent that in most cases make them experience menstruation as a shameful and uncomfortable [6].

Access to sanitary materials and facilities play a major role in contributing to school absenteeism during menstruation and exposes the girls to risks of sexual and gender based violence if

adequate sanitary products and adequate safe facilities are not provided. Lack of sanitary protection material may result in embarrassment and stress due to leakage and smell. This may also hasten the development of fear of using the latrines because their clothes have been stained and so they chose to remain seated. Lack of menstrual hygiene-friendly facilities that are private or situated in unsafe locations disable them from cleaning themselves, changing and disposing the used sanitary materials [7].

Every school is required to have basic water and sanitation infrastructure in order for the female staff and girls to privately manage menstruation hygienically and with dignity [8]. The essential infrastructure include separate toilets for boys and girls with a minimum ratio of one toilet to 30 girls, sufficient water supply based on approximately 500 litres water storage capacity for 100 children, soap for hand washing and space for laundering menstrual absorbent as well as facilities for safe disposal of used menstrual absorbents. Moreover, these toilets should be designed in a way that the girls with disability can easily utilize them without fear. It is against this background that the aim of the study was to determine the factors that influence menstrual hygiene management among adolescent girls in Form one, two, three and four classes in mixed day secondary schools in Kibera.

## 2. METHODOLOGY

The study was quantitative. It utilized the cross sectional study design. The study population comprised 1778 girls in 31 day secondary schools situated in Kibera slums, Nairobi, Kenya.

Proportionate and simple random sampling were used to select 5 mixed day public schools and 10 mixed day private schools in Kibera slums [9]. The sample size was determined using fisher's formula where 324 girls were sampled. Questionnaires were used to collect data.

Quantitative data collection occurred during the school visits by the researcher and the research assistants. Structured questionnaires were

administered to the students who were randomly selected and they chose the answers that best suited their situation from a list of possible alternatives provided. These alternative choices were; strongly disagree = 1, somewhat disagree = 2, disagree = 3, agree = 4, somewhat agree = 5, and strongly agree = 6. The questionnaires comprised information on menstrual hygiene management practices, the level of knowledge and information, the level of access to sanitary materials and facilities and the socio-demographic factors that influence menstrual hygiene management. The students were guided by the research assistants as they filled the questionnaire.

Data cleaning and editing was done to ensure that the collected data was accurate, consistent with the facts, uniformly entered as complete as possible and had been arranged well to facilitate coding and tabulation. Coding was then done whereby answers to responses were put to limited number of categories which were appropriate to the research problem under consideration. These categories are small number of classes that possess the characteristics of exhaustiveness and also that of mutual exclusivity. Classification was then carried out where in this case; classification of attributes where data was classified according to common characteristics was either descriptive or numeric. This reduced the possibility of any ambiguity concerning the said variables. Tabulation was then done where the categorized data was arranged in a concise and logical order. This means that raw data was summarized and displayed in a compact form to allow for further analysis.

Inferential statistics that were used includes Chi Square analysis to test whether there was an effect of the factor, Pearson's correlation to measure the strength of the relationship between the independent and the dependent variables and multi regression analysis to determine whether these are the only factors that influence menstrual hygiene management or there are other factors that also contribute to menstrual hygiene management. In a multiple regression analysis, there are several independent variables and one dependent variable and the predictor equation is presented as;

$$Y = a + b_1x_1 + b_2x_2$$

Where y is the dependent variable and  $x_1$ ,  $x_2$ , are the independent variables in the study. The value

for a is more or less an intercept at the vertical axis and the b's are the partial regression coefficients. Each b represents the amount of change in  $y^1$  for a unit change in the corresponding x value when other x values are held constant.

$y = \beta_0 + \beta_1$  (menstrual hygiene practices) +  $\beta_2$  (access to sanitary materials and facilities) were used where y is the expected effective menstrual practices and management.

This analysis was achieved by use of IBM® SPSS® Statistics 20. The use of a myriad of tests was driven by the need to corroborate the results and to further query the results to find out more about the underlying patterns.

The research data was collected, analyzed and reported honestly. There was objectivity in the selection of the design. Confidentiality was maintained throughout the study. Respondents' rights to privacy and autonomy were ensured through signing of the permission letter and instructions not to write their names in the questionnaire. Procedures of conducting the research as outlined by the National Commission for Science, Technology and Innovation (NACOSTI) such as permit clearance and authorization letter were adhered to.

### 3. RESULTS AND DISCUSSION

#### 3.1 Socio Demographic Characteristics

The respondent information considered in this study included respondent's class, age, village of residence, electricity and water issues, and who the respondent is living with. Findings revealed that close to a third of the participants (26.5%, n = 94) were from four students and the least 23.7% (n = 84) from two. Slightly above one third of the participants were 16 years old. Majority of the subjects were from the village of Laini Saba (28.5%) with 55.5% (n=197). Notably, 11.8% of the participants receive water once a week. Respondents further indicated that electricity is available to only two thirds (66.5%, n = 236). This is summarized in Table 1.

#### 3.2 Menstrual Hygiene Practices

Respondents indicated that commercially produced pads were used with a mean = 4.11, SD 1.433, use of old cloth (Mean = 1.95, SD = 1.453), change of absorbent/pad at least (Mean = 3.79, SD = 1.528), washing hands with

soap after changing pads (Mean = 3.77, SD = 1.605), use of tampons (Mean = 4.10, SD = 1.436), when I have a heavy flow, I use a high density/ thick pad (Mean = 1.71, SD = 1.257), when I have a low flow, I use a low density/ thin pad (Mean = 3.77, SD = 1.524) and wiping from the front towards the back (mean = 3.76, SD =1.598). The findings implies that some hygiene practices were done strongly such as use of pads, tampons and washing of hands while other practices were done moderately and others were not done. Respondent rating of the menstrual hygiene practices is indicated in Table 2.

**Table 1. Socio-demographic characteristics**

Variable	Frequency (n)	Percent (%)
<b>Class</b>		
Form One	85	23.9
Form Two	84	23.7
Form Three	92	25.9
Form Four	94	26.5
<b>Age</b>		
15 years	71	20
16 years	124	34.9
17 years	93	26.2
18 years and above	67	18.9
<b>Village</b>		
Laini Saba	101	28.5
Kisumu Ndogo	24	6.8
Lindi	66	18.6
Soweto	18	5.1
Gatwekera	23	6.5
Mashimoni	57	16.1
Siranga	18	5.1
Makina	32	9.0
Kianda	16	4.5
<b>Water duration</b>		
Every day	197	55.5
Twice a week	58	16.3
Thrice a week	58	16.3
Once a week	42	11.8
<b>Electricity</b>		
Yes	236	66.5
No	119	33.5
<b>Lives with</b>		
Father and Mother	42	11.8
Mother	123	34.6
Father	127	35.8
Guardian	60	16.9

**Table 2. Menstrual hygiene practices**

Statement	Mean	SD
I use commercially produced pads (bought from the shop)	4.11	1.433
I use old clothes/cotton as pads or absorbent	1.95	1.453
I always change my absorbent/ pad at least every 3-4 hours	3.79	1.528
Before and after changing my pad, I always wash my hands with soap and water.	3.77	1.605
I know how to use a tampon and the safety measures involved	4.10	1.436
When I have a heavy flow, I use a high density/ thick pad.	1.71	1.257
When I have a low flow, I use a low density/ thin pad.	3.77	1.524
After short / long call, I wipe myself starting from the front towards the back.	3.76	1.598

### 3.3 Access to Sanitary Materials and Facilities

The majority of the participants indicated that they have access to a disposal facility to dispose pads in a dignified and safe manner (Mean = 3.93, SD = 1.504), followed by we have separate toilets for the boys and the girls with lockable doors (Mean = 3.75 SD = 1.655), I always carry enough pads (3.62, SD = 1.619). Materials and facilities that were accessed moderately included toilets that are equipped with water (2.63, SD = 1.781), bathrooms for change over (2.13, SD = 1.666). Lastly, materials and facilities with lowest agreement included access to school provides soap for washing hands and blood-stained clothes (1.72, SD = 1.286) and carrying of soap in handbags (1.76, SD = 1.407). Other materials and facilities that were accessed though at a low rate were. Access to sanitary materials and facilities is presented Table 3.

### 3.4 Relationship between Respondents' Access to Water and Demographic Characteristics Factors

Respondent's age, village and whoever the participant is living with were reported as statistically significant ( $P < 0.005$ ). Association between respondents' access to water and demographic characteristics is indicated in Table 4.

### 3.5 Correlation Analysis

In order to determine the strength of linear association of the study variables, a correlation was performed. This was geared towards the

realization of the range of values and making a scientific conclusion whether the variables are positively associated, weak association or negative association.. The two factors namely menstrual hygiene practices ( $r = 0.288$ ,  $P < 0.000$ ) and access to sanitary materials and facilities ( $r = 0.863$ ,  $P < 0.000$ ) indicated a weak positive association which was statistically significant at a confidence interval (CI) 95% and a strong positive association which was statistically significant at a confidence interval (CI) 95% respectively. Correlation analysis of the factors contributing to effective menstrual practices and management is indicated in Table 5.

### 3.6 Multiple Linear Regression

It was used to determine the predictor variables that predict effective menstrual practices and management. R shows the relationship between the factors contributing to effective menstrual practices and management. According to research, there exists a strong positive relationship between variables with an R score of 0.868. R square (.753X 100) implies that 75.3% of changes in the menstrual management can be accounted for by menstrual hygiene practices and access to sanitary materials and facilities. It can be concluded that 24.7% of any other changes in effective menstrual practices and management can be associated with other factors that have not been included in the study. The coefficient of determination that the variations in the dependent variable are explained by variation of the independent variables is indicated in Table 6.

**Table 3. Access to sanitary materials and facilities**

Statement	Mean	SD
I can easily access the sanitary material/pad	3.28	1.589
When I don't have sanitary pads, I cannot come to school	2.77	1.666
We have separate toilets for the boys and the girls with lockable doors	3.75	1.655
We have enough toilets that are located in a safe location	3.50	1.733
Our toilets are clean and well lit.	3.32	1.715
Our toilets are equipped with water for washing hands.	2.63	1.781
We have bathrooms to change and clean up	2.13	1.666
I always carry enough pads	3.62	1.619
I always carry soap in my bag	1.76	1.407
We have water tap near the toilets.	2.74	1.828
The school provides soap for washing our hands and our blood-stained clothes.	1.72	1.286
We have access to a disposal facility to dispose our pads in a dignified and safe manner.	3.93	1.504

**Table 4. Relationship between respondents' access to water and the demographic characteristics**

Variables	Water				X <sup>2</sup> (P-value)
	Every day	Twice a week	Thrice a week	Once a week	
<b>Age</b>					43.341(0.000)
15 years	54	9	8	0	
16 years	74	9	23	18	
17 years	40	20	21	12	
18 years and above	29	20	6	12	
<b>Village</b>					53.721 (0.001)
Laini Saba	70	13	9	9	
Kisumu Ndogo	8	9	4	3	
Lindi	32	9	13	12	
Soweto	10	0	5	3	
Gatwekera	14	6	3	0	
Mashimoni	36	6	9	6	
Siranga	9	3	6	0	
Makina	11	6	6	9	
Kianda	7	6	3	0	
<b>Lives with</b>					39.649 (0.00)
Father and Mother	19	8	3	12	
Mother	66	21	24	12	
Father	85	17	16	9	
Guardian	27	12	12	9	

**Table 5. Correlation coefficients**

Variables		Menstrual Hygiene Practices	Access to sanitary materials and facilities	Effective practices and management
Menstrual Hygiene Practices	Pearson Correlation	1		
Access to sanitary materials and facilities	Pearson Correlation	.236**	1	
Effective practices and management	Pearson Correlation	.288**	.863**	1
	Sig level	.000	.000	.000
		.000	.000	.000
	N	355	355	355

**Table 6. Multiple linear regression**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.868 <sup>a</sup>	.753	.751	4.01034
a. Predictors (Constant), Menstrual Hygiene Practices, Access to sanitary materials and facilities				
b. Dependent variable: Effective menstrual practices and management				

**3.6.1 Regression analysis coefficients**

The multiple regression analysis was conducted so as to determine the relationship between

factors influencing effective menstrual practices and management. The equation  $Y = \alpha + \beta_1X_1 + \beta_2X_2$  generated before therefore become:

$$Y = 3.002 + 0.113X_1 + 0.637X_2$$

Where Y is the dependent variable (effective menstrual practices and management), X<sub>1</sub> menstrual hygiene practices and X<sub>2</sub> is access to sanitary materials and facilities. According to the regression equation established, taking all other factors into account (menstrual hygiene practices and access to sanitary materials and facilities) constant at zero, effective menstrual practices and management will be 3.002. The data findings analyzed also show that taking all other independent variables at zero, a unit increase in menstrual hygiene practices will lead to a 0.113 increase in effective menstrual practices and management while, a unit increase in access to sanitary materials and facilities will lead to a 0.637 increases in effective menstrual practices and management.

The independent variable 'menstrual hygiene practices' has the least positive effect on the status of effective menstrual practices ( $\beta = 0.089$ ), and that this is statistically significant. Access to sanitary materials and facilities had the strongest positive effect ( $\beta = 0.842$ ). This is indicated in Table 7.

### 3.7 Discussion

Use of commercial sanitary pads was a popular menstrual hygiene practice amongst girls in Kibera because of the comfort associated with the pads. The views on comfort are similar to El-Gilany, Badawi and El-Fedawy findings in a study on menstrual hygiene among adolescent school girls in Mansoura, Egypt that was published in 2005 [10] that, commercial sanitary products were preferred because they are more comfortable and less likely to leak. It useful to mention that, unfortunately, as Adika, Yabga, Apiyanteide, Ologidi and Ekpo indicate in a study on the perception and behavior on use of sanitary pads during menstruation among adolescent school girls in Bayelsa State, Nigeria published in 2011 [11] that, for many girls, such products are usually unavailable and/or unaffordable. Unlike commercial pads, use of old cloth was not favored by a majority of respondents. Similar sentiments on old cloths were mentioned by Adinma, and Adinma in a study on perceptions and practices on menstruation amongst Nigerian secondary school girls published in 2018 [12] that women expressed concerns about reusing old clothes.

Other than cloth Averbach, Sahin-Hodoglugil, Musara, Chipato and Van der Straten in a study on menstrual protection in Zimbabwe, published in 2009 [13] mentioned other unhygienic practices that included insertion of newspaper or tissue paper. Other practices included change of absorbent/pad that were mentioned by a majority and washing of hand with soap. These views are in line with Khanna, Goyal and Bhawsar [14] assertion that girls have access to a variety of sanitary absorbents. The research findings indicate a majority mentioning use of tampons which is in line with Sommer, Caruso, Sahin, Calderon, Cavill, Mahon, Phillips-Howard [15] view that among the common practices surrounding menstrual hygiene was insertion of a tampon. Most importantly is to note that, if one has low blood flow, use of a highly absorbent tampons will be inversely proportional to each other making them vulnerable to toxic shock syndrome which can be life threatening. In a nutshell adequate menstrual hygiene management would therefore require clean absorbents, adequate frequency of absorbent change, washing the body with soap and water, adequate disposal and privacy for managing menstruation as stated in the same way by Narayan, Srinivasa, Peltó, and Veeramall in a study on puberty rituals reproductive knowledge and health of adolescent schoolgirls in South India, published in 2001 [16].

Access to a disposal facility to dispose pads was cited by a majority of respondents. This contradicts earlier sentiments by Oche, Umar, Gana and Ango in a study on Menstrual health: the unmet needs of adolescent girls' in Sokoto, Nigeria, published in 2012 [17] report that showed few girls were accessible to disposal facilities. Though it is useful to argue that, there were separate toilets for the boys and the girls with lockable doors, a moderate number pointed that, they didn't have especially in extremely inaccessible areas. Ndlovu and Bhala study on menstrual hygiene – a salient hazard in rural schools in Masvingo district of Zimbabwe, published in 2016 [18] illustrates that school going girls in low income countries compromise their ability to manage their menstruation with hygiene and privacy because of inadequate water and sanitation facilities. Most schools lack sufficient latrines for girls and female teachers. These toilets are often unclean, fewer in number, unsafe and others have no doors subjecting the girls to harassment from boys.

**Table 7. Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	3.002	1.056		2.842	.005
Menstrual Hygiene Practices	.113	0.035	0.089	3.274	.001
Access to sanitary materials and facilities	.637	0.021	0.842	30.890	.000

a. Predictors (Constant), Menstrual Hygiene Practices, Access to sanitary materials and facilities  
b. Dependent variable: Effective menstrual practices and management

The study was curbed by a few limitations. There was difficulty in accessing the area of study given its geographical and demographic characteristic. The researcher resolved this by working with the locals who were conversant with the area. Some of the girls who were issued with questionnaire sometimes failed to report to school owing to their social economic status. The researcher had to wait until they reported back to school.

The study recommends that the schools should partner with Community Based organization (CBOs), the private sector and the Ministry for Gender, Children and Social Development to ensure that secondary going girls in Kibera are provided with materials and facilities necessary to ensure effective menstrual management.

#### 4. CONCLUSIONS

Our study showed that there is a strong relationship between variables where 75.3% of the change in effective menstrual practice and management is attributed to menstrual hygiene practices and access to sanitary materials and facilities. A positive change in these variables results in a positive change in menstrual management and practices.

The study showed that there should be improvement in the provision of washing areas considering the schools are day schools most of them don't have shower areas and do not provide students with soap for washing in case they have stained. They are forced to stay like that till they get home subjecting them to feelings of discomfort and shame.

#### DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

#### CONSENT AND ETHICAL APPROVAL

The proposal was presented to the Kenyatta National Hospital Ethics Committee and ethical clearance was obtained. After obtaining the ethical clearance, an application seeking permission to carry out a research was done to National Commission for Science Technology and Innovation and when a permit was granted. Additionally, an introductory letter was obtained from the Nairobi County Director for Education. The introductory letter was provided to the secondary school principals who are the custodians of the students while at school seeking assent for the respondents. With the assent of the Principal consent was obtained from the individual students by the research assistants under the supervision of the principle. Only those students who assented to participate took part in the study. The respondents' personal identification information was not recorded for purposes of confidentiality and anonymity.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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